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Office of Personnel Management

Aircraft Operation Series

GS-2181

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NOTE

This standard has been converted from the original paper format to electronic format without substantive change in series coverage or grading criteria. The standard was reviewed to correct errors that may have been introduced during the conversion process. In some standards minor corrections were made such as updating references to other documents that may have become obsolete, or correcting minor typographical errors in the original standard. Any errors that remain due to conversion to electronic format should be minor and are not intended to change the meaning of the original standard.

If you find page references near the right hand margin of this standard they indicate the pagination of the official, printed version of this standard. For example, a notation "PAGE 2, 4/88, TS-87" would mean that (1) page two of the printed version begins here, (2) the date of issuance was 4/88, and (3) the Transmittal Sheet number was TS-87.

Aircraft Operation Series

GS-2181

CONTENTS

SERIES DEFINITION

This series includes all positions primarily involved in: (1) piloting or copiloting of aircraft to carry out various programs and functions of Federal agencies; (2) providing ground and flight
instruction and in-flight evaluation in the piloting of aircraft; (3) flight testing of developmental and modified aircraft and components; (4) in-flight inspection and evaluation of air navigation facilities and the environmental conditions affecting instrument flight procedures; and (5) performing staff work concerned with planning, analyzing, or administering agency aviation programs, where the work requires primarily the application of pilot knowledge and skills.

This standard supersedes the standard for the Aircraft Operation Series, GS-2181, issued in December 1967 (TS-71) and revised in May 1979 (TS-35).

SERIES COVERAGE

Positions covered by this series have in common the paramount requirement for the knowledge and skills necessary to pilot one or more categories of aircraft. Such positions, in addition to their piloting skills, require a knowledge of the agency program or function which forms the basis for the flying assignments. Specifically, this series includes positions of:

-- "Line" or operational pilots and copilots of fixed and/or rotary wing aircraft;
-- Instructors providing ground and flight training in primary flight techniques, tactical or program operations, or instrument flight; refresher training; or transition training to other categories of aircraft; and positions concerned with evaluation of flight instruction programs;
-- Pilots responsible for the flight testing of aircraft and/ or components;
-- Pilots responsible for the in-flight inspection, evaluation, and certification of air navigation facilities, and the instrument procedures associated with such facilities; and

-- Staff specialists in agency aviation programs, where performance of the work requires primarily the application of pilot knowledge and skills.

EXCLUSIONS

1. Positions which have as their primary responsibility the performance of, or providing ground and flight instruction in, air navigation or weapons systems specialist duties are classified in the Air Navigation Series, GS-2183.

2. Positions of flight crew members and instructors performing duties in flight engineering, aerial refueling, and aircraft loading, are classified in the Aircrew Technician Series, GS-2185.

3. Positions which involve primarily the maintenance or repair of aircraft or components (e.g., engine, electrical, or hydraulic systems) and which have as their paramount requirement the application of knowledge and skills gained through trade or craft experience are graded under the Federal Wage System.

4. Positions which primarily require the application of the principles of professional engineering and related mathematical and physical science concepts are classified in the appropriate series in the Engineering and Architecture Group, GS-800.

5. Positions concerned with technical work in the development, administration, and enforcement of regulations and standards governing civil aviation safety are classified in the Aviation
Safety Series, GS-1825.

6. Positions concerned with the investigation and prevention of accidents and incidents involving aircraft and with the establishment of programs and procedures to provide for the notification and reporting of aircraft accidents are classified in the Air Safety Investigating Series, GS-1815.

7. Positions which require primarily a professional knowledge of education and training or a practical knowledge of the principles and techniques of education and training in combination with a knowledge of the subject, occupation, or field in which education, instruction, and training are given are classified in an appropriate series in the Education Group, GS-1700, when they have their career relationships in the education and training field. (Positions of instructors, course material writers, and staff instructional specialists in which the requirement for experience and training as a pilot is primary, and which have their career relationships in the Aircraft Operation Series, GS-2181, are classified in this series.)

8. Positions primarily involving instruction through the use of flight simulators are classified to other occupational series as appropriate (e.g., in the Education Group, GS-1700) unless other duties performed require the application of pilot knowledge and skills.

TITLES

1. For positions which primarily operate aircraft for such purposes as carrying passengers, hauling freight and supplies, making observations, or performing patrols, the basic title is *Pilot* prefixed by the type of aircraft flown as follows:

Airplane Pilot -- operates fixed wing aircraft

Helicopter Pilot -- operates rotary wing aircraft

Aircraft Pilot -- operates both fixed and rotary wing aircraft

These are also the appropriate titles for positions which encompass more than one of the following specializations when a more specialized title is not more appropriate.

2. For positions involved in conducting the in-flight inspection and evaluation of existing and proposed air navigation facilities, and the environmental conditions affecting instrument flight procedures, the authorized title is *Airspace System Inspection Pilot.*

3. For positions primarily involved in functional flight tests of aircraft after repair or replacement of worn or damaged components or the addition of approved modifications, the authorized title is *Maintenance Test Pilot*.

4. For positions primarily involved in flight testing of the handling characteristics and performance of developmental or modified fixed and/or rotary wing aircraft to determine airworthiness, the authorized title is *Flight Test Pilot.*

5. For positions which provide ground and flight instruction, including in-flight evaluations, the basic titles are:

Airplane Flight Instructor -- instructs in fixed wing aircraft

Helicopter Flight Instructor -- instructs in rotary wing aircraft

Aircraft Flight Instructor -- instructs in both fixed and rotary wing aircraft

Airspace Systems Inspection Flight Instructor --instructs in airspace system inspection

Test Pilot Flight Instructor -- instructs in test flying

6. Positions in this series responsible for the management of aviation programs or the performance of various staff activities related to such programs are titled in accordance with the above criteria. For example, staff positions in a program primarily devoted to providing flight instruction would be titled according to the instructions in 5 above.

7. Other specialized positions in the Air Reserve Technician program appropriately classified to this series may have other titles as indicated in FPM Supplement (Internal) 930-71, *Recruitment of Air Reserve Technicians Through Competitive Examination.*

8. For positions which meet the titling criteria of the Supervisory Grade-Evaluation Guide, *Supervisory* should be prefixed to the appropriate position title.

GLOSSARY OF TERMS

For the purposes of this standard, the terms given below have the meaning stated, although precise definitions may vary among agencies.

Air Navigation Facility -- Any facility used in, available for use, or designated for use in aid of air navigation, including landing areas; lights; any apparatus or equipment for disseminating weather information, for signaling, for radio directional finding, or for radio or other electrical communication; and any other structure or mechanism having a similar purpose for guiding or controlling the landing, takeoff, or flight of aircraft.

Aircraft -- Unless specifically modified, the term includes both helicopters and airplanes.

Airplane -- Refers only to fixed wing craft.

Area Navigation -- A method of navigation that permits aircraft operations on any desired course (e.g., other than Federal airways) using air navigational aids or self-contained navigational capability.

Autorotation -- A helicopter flight maneuver in which the pilot uses only the airflow through the rotor system to make a controlled descent, such as would be required in the case of engine failure.

Category of Aircraft -- The broad classification of aircraft as to either fixed wing (airplane) or rotary wing (helicopter).

Class of Aircraft -- Refers to the classification of aircraft as to single engine or multiengine.

Copilot -- Full assistant to the pilot-in-command, assisting the latter in pre-flight checks, operating various systems, and alternating with the pilot in flying the aircraft.

Flight Examiner -- A qualified flight instructor who has responsibility for instructing, evaluating, and examining other instructors as well as rated pilots.

General Aviation -- That portion of civil aviation exclusive of air carriers and large commercial aircraft operators.

Helicopter -- Refers only to rotary wing craft.

Instrument Flight -- The technique of flying aircraft through reference to instruments in the aircraft in conjunction with signals from air navigational aids and communication with controlling agencies.

Instrument Flight Procedures -- Published enroute and terminal (departure and arrival) procedures for instrument flight.

National Airspace System -- The network of United States airspace, air navigation facilities and equipment, airports or landing areas, and aeronautical charts, information, and services.

Pilot in Command -- The pilot responsible for the operation and safety of an aircraft during flight.

Reserve/Reservist -- Refers to all members and/or components of the armed forces reserves -- National Guard, Army Reserve, or Air Force Reserve.

Visual Flight -- The technique of flying aircraft through reference to visible terrain and topographical features.

OCCUPATIONAL INFORMATION

Aviation organizations in the Federal Government support a wide variety of agency programs and missions including:

-- Military flight training.

-- Natural resource work.

-- Law enforcement.

-- Flight testing of aircraft.

-- Airspace system inspection.

Within these broad programs, agencies use pilots to perform a variety of assignments ranging from point-to-point flying of transport cargo or passengers to flight operations requiring, in addition to pilot skills, very specialized knowledge and skills related to a particular agency program or function.

Military Flight Training: In active military and the reserve forces, civilian pilots provide ground (academic) and flight instruction to unit aviators to upgrade pilot skills, qualify them to
fly unit assigned missions, and ensure, through periodic evaluations and continuation training, that pilot and crew proficiency are maintained. Training activities relate to the particular mission and aircraft assigned and include combat tactics, weapons delivery, gunnery practice, aerial reconnaissance, search and rescue, aerial refueling, and air drop of cargo and personnel.

In addition to their training responsibilities, flight instructors in the reserve programs perform assignments related to the operational readiness of their unit, such as performing maintenance test flights, supervising flight operations, scheduling aviator training, and performing administrative activities related to the flight training program.

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Civilian instructor pilots employed by the active duty forces provide or monitor initial academic and flight instruction programs for military students. They also provide student aviators advanced training in combat tactical operations and maneuvers and flight under instrument flight rules.

Natural Resource Work: Agencies engaged in natural resource work employ pilots in such programs as fire detention and suppression, enforcement of fish and game laws, conducting wildlife surveys and counts, aerial application of seeds and sprays, and conducting photographic or aerial surveys. Pilots in fire control work, for example, fly lead aircraft to direct tankers dropping fire retardant, operate helicopters equipped with torches to set back fires, deliver smokejumpers and supplies to the fire scene, and fly sensor-equipped airplanes to detect fires in their initial stages. In addition, some pilots in these programs evaluate the capabilities of private
contractors to perform similar assignments.

Law Enforcement: Aircraft are used in law enforcement programs for such purposes as detecting and tracking aliens who enter this country illegally, intercepting and apprehending smugglers, and controlling the entrance of narcotics. Individuals in those programs may serve both as a law enforcement officer and pilot. When they are not flying, they typically perform investigative or other work related to the law enforcement program.

Flight Testing: Developmental aircraft, aircraft which are modified to the extent that flight characteristics and performance parameters are significantly altered, and aircraft which have been (()) repaired or had components replaced, undergo rigorous testing and evaluation before being approved for general use. Pilots in this program conduct flight tests to determine whether performance, maneuverability, control, stability, and other flight characteristics meet prescribed
safety standards.

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Airspace System Inspection: Pilots are involved in the inspection and airborne certification of air navigation facilities (NAVAIDS) instrument flight procedures and/or the development and amendment of terminal and enroute procedures in the national airspace system. In-flight inspections are for the purpose of evaluating and certifying that existing and proposed NAVAIDs and instrument flight procedures (1) adhere to prescribed standards and tolerances, (2) support the instrument flight procedures predicated on the NAVAID, and (3) ensure that the instrument flight procedures are safe and practical. Instrument flight procedures are regulatory and their development or amendment involves applying criteria to formulate,

review, approve, and publish procedures for instrument approach and departure of aircraft to and from civil and/or military airports.

Management and Staff Specialist Positions: Incumbents of these positions perform a variety of functions related to agency aviation programs, including:

-- Training of agency pilots;

-- Acquisition and utilization of aviation resources;

-- Developing equipment applications, policies, procedures, and regulations governing an aviation program; and/or

-- Managing the agency aviation program.

Nature of Aircraft Pilot Work

The aircraft involved: In carrying out the programs and assignments described above, the Federal Government operates a wide variety of aircraft, ranging from light single- and twin-engine airplanes and helicopters to heavy, multiengine airplanes. The equipment involved includes standard models of civilian aircraft, aircraft specifically modified or equipped for a particular assignment, sophisticated military aircraft (e.g., tactical fighters, (()) tankers, and
transports), and the most advanced aircraft under development.

Pilot responsibilities: Irrespective of what aircraft they fly and the purpose of the flight, all pilots have certain responsibilities in common. These include such preflight planning duties as:

-- Securing current and forecast weather information to determine conditions along the proposed route of flight and at the destination;

-- Planning the flight through the study of maps and charts to determine routing, intermediate stops, alternate destination, fuel requirements, estimated flying time, and, as required, filing the aircraft flight plan;

-- Checking or verifying that the aircraft is ready for flight, including such aspects as loading and weight distribution, maintenance or service conditions, and performing prescribed preflight checks; Ensuring that any passengers and crew members are briefed on the nature and purpose of the flight, and the procedures to be followed in an emergency; and

-- Obtaining the proper clearances to begin the flight.

Certain of the above tasks may be delegated to the copilot or crew members when present. However, ultimate responsibility for their performance remains with the pilot-in-command of the aircraft.

Once airborne, the pilot's responsibilities vary according to the nature and purpose of the assignment. Foremost, however, is the safe operation of the aircraft. This includes: adhering to flight procedures and parameters specified in the aircraft flight manual; communicating and coordinating with controlling agencies; monitoring performance of the aircraft and progress of the flight; and taking corrective action, including the use of emergency procedures as required. Some assignments, such as transporting cargo or personnel, impose few demands on the pilot outside of the actual operation of the aircraft. Other assignments require that pilots divide their attention between flying the aircraft and other (()) mission related tasks, or that they coordinate and direct the actions of various crew members.

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Postflight activities include maintaining logs on the operating status of the aircraft, preparing flight reports, coordinating with maintenance personnel on service conditions, and performing postflight checks. For flight instructor assignments, postflight activities include a critique of students' performance and progress in training. Assignments typically include, in addition to flying, related duties which support the aviation program or the mission of the agency. Ground duties may involve, for example, serving as the organization's safety or maintenance specialist; participating in the developing of aircraft equipment applications; reviewing aircraft test programs; or performing administrative tasks related to pilot training, including aircrew scheduling, contingency and war planning, deployments, aircrew proficiency training, and aircrew evaluation.

ANALYSIS OF CLASSIFICATION FACTORS

The knowledge and skills required of positions in this occupation are influenced primarily by three factors:

-- The aircraft operated;

-- Nature and purpose of assignments; and

-- Degree of hazard involved.

The following sections illustrate how each of these factors, singly and in combination, influence the level of knowledge and skills and thus the difficulty associated with various flying assignments.

Aircraft Operated

The knowledge and skills required of pilots are influenced by the characteristics of the particular aircraft flown in the work. Considered strictly from the standpoint of flying the aircraft, a higher level of knowledge and skills is required to pilot a heavy multiengine transport airplane than is required to pilot a light single engine airplane. In this instance, the heavier aircraft has more systems that are more complex to understand and to operate. The heavier aircraft has capabilities, in terms of operating range and ceilings, that are not characteristic of light single engine aircraft. Generally, the heavier aircraft operates at greater speeds requiring a higher degree of skill to maneuver and control than the lighter aircraft.

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However, the various characteristics of the aircraft (e.g., weight, speed, propulsion system, or performance capabilities) are not precisely quantifiable for use as grade level benchmarks. Moreover, a wide variety of aircraft are involved in Federal aviation programs, and this inventory of aircraft undergoes continuous change to meet new program or operational requirements or to take advantage of technological advances. For these reasons, it would be virtually impossible to provide quantified aircraft complexity criteria of any validity or lasting value.

Another problem associated with identifying a particular aircraft with a specific grade is that this factor is influenced by the other two. Thus, flying a given aircraft may span two or more grade levels due to the influence of the degree of hazard involved, and/or the nature and purpose of assignments. On the other hand, the degree of hazard involved and the nature and purpose of assignments may be such that the level of difficulty is characteristic of only one grade level, irrespective of the aircraft flown.

While the aircraft involved do not lend themselves to precise grouping with strictly defined breakpoints between groups, broad distinctions can be made on the basis of the aircraft itself and its general performance characteristics and capabilities. To provide a general frame of reference for the grade level concepts used in this standard, aircraft are separated into two broad groups.

One group includes a variety of aircraft having the following characteristics:

-- Light single engine airplanes or helicopters designed to carry two to four people, including the pilot, and used for patrol or utility work;

-- Light twin-engine turbine or piston powered airplanes (typically less than 12,500 pounds gross takeoff weight);

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-- Operating speeds in the slow to medium range in comparison to other aircraft (typically 250 knots or less);

-- Operating ceiling restricted (although some twin-engine aircraft may be pressurized);

-- Primarily used for visual flight operations, although some aircraft may have varying capability for instrument flight;

-- Typically designed for short-range flight operations.

The other broad group includes aircraft with the following characteristics:

-- Heavy multiengine turbine powered airplanes (with gross takeoff weights over 12,500 pounds) used for transporting passengers and/or cargo;

-- High-performance turbine airplanes (over 12,500 pounds) including military fighters and reconnaissance airplanes;

-- Airplanes with extended range, altitude, and instrument capabilities; Heavy attack and transport helicopters (with gross takeoff weights in excess of 12,500 pounds); and

-- Operating speeds significantly higher in comparison to those described above (e.g., typically in excess of 250 knots).

The material above is designed to illustrate typical characteristics of aircraft that impact the knowledge and skills required of pilots. Individual aircraft may not fit precisely all of the characteristics described. Users are specifically cautioned against emphasizing one characteristic of the aircraft as the basis for classifying a position to a particular grade level, or making a mechanical linkage of a particular aircraft to a specific grade level.

For some positions, pilots are required to operate or instruct others in the operation of both fixed and rotary wing aircraft. The requirement to be rated in both categories, by itself, should not be used as a basis for classifying the position to a higher grade. However, to the extent that such assignments result in a mixed-grade position, the guidance in the introductory material to the
Position-Classification Standards applies.

Nature and Purpose of Assignments

This factor considers the influence of the flying assignment on the level of knowledge and skills required of the pilot. Flying imposes demands on pilots which vary according to the use of the aircraft and the particular tasks or functions that must be accomplished during flight. Thus, the nature and purpose of the work influences the level of the pilot skills required to complete the assignment, the level of knowledge required to perform particular tasks or functions, or both of these elements. To illustrate the influence of the assignment, a greater degree of skill is required to pilot a helicopter at night carrying passengers to remote and

confined spaces, such as a forest fire site, than is required to pilot the same helicopter during daylight hours to carry passengers between two airports.

Assignments which consist solely of flying an airplane or helicopter from one point to another impose few, if any, demands on the pilot beyond application of basic pilot knowledge and skills. Given the same aircraft and a requirement to use the airplane or helicopter to conduct surveillance of suspected criminal activity (e.g., violation of hunting or fishing laws), the knowledge and skills required have been altered. A similar situation exists with respect to the influence of the assignment for specializations other than pilot. For example, a higher level of knowledge and skills is required to instruct pilots in advanced flight procedures and maneuvers (e.g., combat or tactical flight) than is required to instruct in the basic techniques of flying.

The nature and purpose of assignments factor is discussed in the grade level material in terms of typical work situations, treated in relation to the aircraft operated and degree of hazard involved in the assignment.

Degree of Hazard

Flying an airplane or helicopter under "optimum" conditions involves risks that are not significantly different from those present in many other occupations. Optimum conditions exist (()) when the aircraft is operated well within its flight parameters (e.g., in terms of speed or loading) in favorable weather, to execute normal flight procedures and standard maneuvers which are well within the capability of the aircraft and the pilot. Unlike most other occupations, however, flying is particularly unforgiving when confronted by human error, or failure of
an aircraft system critical to flight.

All pilots are required to know and demonstrate skill in executing appropriate emergency procedures for the aircraft involved. Similarly, all pilots are required to know the pertinent limitations of the aircraft, operations that must be avoided, and the safety precautions to be observed. All agencies devote considerable attention to flight safety and standardization programs to ensure that proven and safe flight procedures are followed. To eliminate the possibility of mechanical failure, developmental aircraft and components undergo exhaustive testing to demonstrate airworthiness. Similarly, all agencies adhere to strict quality control procedures covering the maintenance and overhaul of aircraft. Nonetheless, because the elements of pilot error and mechanical failure exist, the factor of hazard has been taken into account in the development of this standard.

In the following paragraphs, the different degrees of hazard are described in conceptual terms to provide a general framework for understanding the more specific illustrations used in the grade level material.

Minimum Hazard: A minimum degree of hazard is characterized by generally favorable conditions for carrying out the assignment. The aircraft is flown in a normal configuration (e.g., in terms of speed and loading), using standard flight rules or under instrument flight conditions. Assignments involve primarily point-to-point flying using landing areas that are fully adequate for the aircraft involved. Few, if any, other tasks are required so that the pilot may devote essentially full attention to flying the aircraft. Also typical of this degree are assignments involving a larger number of tasks, when the tasks do not interfere significantly with the operation of the aircraft, e.g., the testing of communications or navigation equipment, or transporting passengers and cargo.

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Marked Hazard: Assignments characteristic of this degree regularly involve exposure to situations requiring a significantly higher level of pilot skills when compared to the minimum degree. For example, in addition to point-to-point flying, assignments may involve responsibility for making extended overseas flights. Also, by way of contrast, the work may entail substantial "back country" flying with responsibility for operating in mountainous terrain at night using landing areas that are typically unimproved and restricted in size under less than ideal conditions. Military flight training assignments frequently involve close formation or high-speed low-altitude and high-speed intercept flying. Flight instruction assignments require greater attention to the actions of the student while monitoring the attitude of the aircraft. Flight test assignments at this degree involve testing of aircraft which have undergone repair or maintenance of major systems, to verify that the original flight and handling
characteristics have been restored.

Substantial Hazard: Assignments characteristic of this degree involve situations that require materially greater skills, in comparison with lower degrees of this factor, situations that are in themselves very hazardous, or a combination of both of these elements. A very high degree of skill is required to pilot the aircraft because of the flight procedures, maneuvers, or environmental factors involved, e.g., maneuvering close to mountainous terrain where visibility is restricted and air currents are unstable, or flying very precise patterns close to the surface in highly congested terminal areas. Such assignments may be further complicated by performance of a number of tasks requiring precise timing and execution. Other situations typical of this degree may result from constant diversion or division of attention from flying the aircraft and require immediate response on the part of the pilot to avert an incident or take corrective action.

Situations that are substantially hazardous in themselves include: using night vision goggles in high- or low-speed flight at very low altitudes, operation of the aircraft in a manner not recommended by the flight manual (e.g., piloting airplanes at very low speeds and altitudes or, in the case of helicopters, flying outside of the recommended height/velocity profile), or performing (()) assignments that require waiver of safety standards and regulations, such as using aircraft to conduct surveillance of other aircraft.

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Flight test work characteristic of this degree involves performance of a number of tests under critical conditions of loading, speed, maneuvering, weather, close proximity to the ground, and aircraft configuration, including engines and controls being intentionally made inoperative. Extensive knowledge and experience is exercised to evaluate the operational procedures and mechanical and design deficiencies of new or modified aircraft and to recommend corrective
action.

Interrelationship of the Factors

In the grade level material, the three factors described above are considered in relation to one another. Each work situation reflects the impact of the aircraft operated, the nature and purpose of assignments, and the degree of hazard involved on the level of knowledge and skills required of the pilot. This is important, since some work situations may be equivalent to each other in grade level even though the individual factors in one differ from the factors in another. That is, the combination of factors in one situation may balance out to the same total grade impact as a different combination of factors in a second situation. For example, a situation may involve: (a) a flight with a substantial degree of hazard; for (b) the purpose of training students under visual flight rules; in (c) light aircraft. A second situation may involve: (a) a flight with a minimum degree of hazard; for (b) the purpose of delivering supplies under instrument flight rules; in (c) heavy aircraft. In total impact, the second situation requires a degree of knowledge and skills which is equivalent to that required in the first example. Thus, the illustrations at each grade level are discussed in terms of the three factors in combination, and no one factor is to be considered as grade controlling by itself. Similarly, users are cautioned against associating a particular aspect of these factors, such as a substantial degree of hazard, with a specific grade level.

Other Classification Factors

While this standard focuses specifically on the three factors described above, other classification factors have been taken into account in developing the evaluation criteria, but are not treated separately in the grade level material. For example, a high degree of independence of action during flight is characteristic of all pilot-in-command assignments, and this is reflected in the grading criteria. Similarly, all pilots follow specifically the guidelines and operating instructions laid out in the flight manual as well as instructions concerning the conduct of flight operations contained in agency program directives and regulations. The existence of these rather specific guidelines does not supplant the need for judgment on the part of pilots. Rather, it indicates that the factor of guidelines has little value in distinguishing among grade levels for pilot positions. Other factors such as complexity,

scope and effect, and physical demands of the work, though not identified separately, are subsumed under the aircraft operated and nature and purpose of assignment factors.

NOTES TO USERS

Application of Grading Criteria

The following section provides grade level criteria for typical nonsupervisory positions in grades GS-9 through GS-14. The grade level material includes a brief summary of the grade level, followed by specific illustrations of duties and responsibilities characteristic of that grade described in terms of the three classification factors discussed above.

Copilots

The copilot is usually a full assistant to the pilot-in-command in every sense of the term, and assists the pilot in preflight checks, operates various systems, and alternates with the pilot in flying the aircraft. Under these circumstances, the copilot position is classified one grade level[1] below that of the pilot. When the copilot position is less than a full assistant (e.g., when in training for the copilot position and carefully observed and double-checked in every action), the grade would normally be two grade levels[2] below that of the pilot.

Staff Specialists

Staff specialists in this occupation are of several types. Illustrative of these are flight instructors who develop instructional techniques and methods, plan and implement new programs of instruction, develop methods of instruction courses, and formulate quality control procedures and policies to assure standardization of training and evaluation. When the knowledge and skills gained through experience and training as a pilot are essential for performance of such work, and the positions are in the career field covered by this series, such positions should be evaluated through comparing the knowledge and skills required in the positions to the knowledge and skills at the various levels described in this standard.

As with all classification through cross-reference, variations between such staff positions and the operational positions contemplated by the standard must be considered. For example, the lack of responsibility for the actual operation of aircraft is significant with respect to

[1] Grade level refers to the normal pattern in a two-grade interval occupation (i.e., GS-5-7-9-11-12-13-14-15).

[2] Ibid. p. 17.

consideration of the degree of hazard involve d. Such lack may be offset by other compensating factors, such as the specialized program knowledge required. In evaluating such positions, appropriate reference should be made to classification standards for related work.

Mixed Positions

Some positions may require a combination of pilot duties and other duties requiring highly specialized knowledge and skills such as to warrant allocation to another specialized series based on the primary purpose of the position and/or career ladder consideration. In such cases, this standard should be used to evaluate the pilot duties and responsibilities.

Supervisory Positions

This standard provides classification criteria for nonsupervisory positions only. Supervisory positions should be evaluated by reference to the Supervisory Grade-Evaluation Guide.

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GRADE LEVELS

PILOT, GS-2181-9

Assignments characteristic of the GS-9 level involve application of the knowledge and skills required:

-- To fly light single- or twin-engine airplanes or helicopters primarily under visual flight rules with responsibility for such operations as ferrying the aircraft or carrying freight from one point to another.

-- To fly light single- or twin-engine airplanes or helicopters under visual flight rules with responsibility for various kinds of photographic survey work.

Assignments at this level involve planning the route of flight, securing the necessary clearance, and navigating by reference to aeronautical charts, compass, and terrain features under visual flight conditions.

The assignments entail a minimum degree of hazard in that they typically involve:

-- Operating to and from airfields that are fully adequate for the aircraft;

-- Point-to-point flying utilizing normal flight procedures;

-- Operating primarily in the daytime under favorable weather conditions; and

-- Few, if any, demands on the pilot to perform tasks other than those connected with flying the aircraft.

Also included at this level are positions undergoing ground and light training (e.g., as a copilot) to attain the knowledge and skills required to perform more difficult flying assignments.

PILOT, GS-2181-11
FLIGHT INSTRUCTOR, GS2181-11

Assignments characteristic of the GS-11 level involve application of the knowledge and skills required:

-- To instruct or evaluate students in the basic techniques involved in flying light single- or twin-engine airplanes or helicopters under visual flight rules.

-- To fly light single- or twin-engine airplanes or helicopters over unfavorable terrain, e.g., mountains, forest, or deserts with responsibility for operating from confined or isolated areas primarily under visual flight conditions.

-- To fly light single- or twin-engine airplanes or helicopters along established airways with responsibility for transporting passengers and supplies among a variety of familiar destinations.

Flight Instruction Assignments

Instruction assignments at the GS-11 level involve training or evaluating student pilots in the basic techniques of flying one or two models of light single- or twin-engine airplanes or helicopters under visual flight rules. The basic techniques are those required to operate from runways of sufficient size for the aircraft under favorable weather conditions with no load beyond the minimum required, e.g., fuel. GS-11 assignments include responsibility for conducting ground classes from prepared lesson plans; grading and evaluating students' performance and progress; and recommending continuation of students' training or elimination from the training course.

Such assignments involve a marked degree of hazard due to the fact that the instructor must devote considerable attention to both the proper execution of flight procedures by the student and the flight attitude of the aircraft, and be prepared to immediately assume control should a hazardous situation occur.

Flying Assignments

Flying assignments at this level are characterized by the requirement for a higher degree of skill and judgment than is typical of the GS-9 level. The higher requirements may be due to the degree of hazard involved or the level of knowledge and responsibility as illustrated by the following:

1. Some assignments involve flying light single- or twin-engine airplanes or helicopters over unfavorable terrain such as mountains, forests, or deserts with responsibility for operating from landing strips which are restricted in size or are in isolated areas or both. For the most part, this kind of assignment is performed in the daytime under favorable weather conditions for such purposes as delivering supplies or freight.

A marked degree of hazard is present in the assignment requiring a high degree of skill and judgment, e.g., to fly light airplanes to and from airstrips where only one-way operations are possible, or to operate helicopters from forest landing pads with minimal clearance.

2. Assignments to transport passengers and/or supplies at the GS-11 level typically involve flying one or more models of light twin-engine airplanes. Flights regularly include trips made to a variety of familiar locations. These flights are made both day and night utilizing Federal airways and require skill in the use of instrument flight techniques.

Except for unpredicted storms, these flights are made under favorable weather conditions, and are characterized by a minimum degree of hazard. Assignments at this level involve a higher degree of skill than assignments at grade GS-9 in that they involve flying to a variety of different locations applying instrument flight techniques. Also, planning trips requires more skill in analyzing present and future weather conditions along the route of flight, avoiding unfavorable weather, and considering alternate routes and destinations.

PILOT, GS2181-12
MAINTENANCE TEST PILOT, GS2181-12
FLIGHT INSTRUCTOR, GS2181-12

Assignments characteristic of the GS-12 level involve application of the knowledge and skills required:

-- To instruct or evaluate students or rated pilots in the flight techniques required to fly tactical operations, such as shortfield takeoffs and landings, flight formations, or aerobatics in light single- or twin-engine airplanes or helicopters under visual flight rules.

-- To fly light single- or twin-engine airplanes or helicopters at low altitudes and speeds over unfavorable terrain with responsibility for making patrols and operating from confined or isolated areas.

-- To fly heavy multiengine transport airplanes to various destinations, using instrument flight rules, for the purpose of transporting supplies and equipment.

-- To fly a variety of light twin-engine airplanes or helicopters to a variety of locations, some of which are unfamiliar, for the purpose of transporting passengers. Flights include both day

and night flying and the use of instrument flight techniques, generally in favorable weather conditions.
-- To conduct functional flight checks of light airplanes or helicopters following repair, maintenance, or the installation of approved modifications to aircraft systems.

Flight Instruction Assignments

1. Flight instructor assignments for light single- or twin-engine airplanes and helicopters involve training or evaluating students in the advanced techniques required, for example, in short-field takeoffs and landings under maximum loads, flying in formation, performing evasive maneuvers, and aerobatics. Students are taught the procedures to use in emergencies such as engine failures and malfunctions of hydraulic and electrical systems over rough terrain, e.g., hills and forests both day and night. Assignments at this level include responsibility for reviewing students' basic training and determining their ability to progress to further advanced courses; determining through evaluation if students should continue or be eliminated; and
recommending additional training for students whose progress is unsatisfactory.

Assignments at this level are distinguished from those at the GS-11 level primarily in that very advanced techniques are taught at this level. Responsibility for also training or evaluating students in the basics of instrument flight (i.e., training pilots to takeoff, fly straight and level, execute turns, climb, descend, and recover from unusual altitudes, and fly prescribed patterns using basic flight instruments controlling attitude, altitude, speed, and direction) will not remove a position from the GS-12 level. Such assignments entail a substantial degree of hazard. In addition to the factors influencing hazard in instructor work, assignments at this level involve flight maneuvers and techniques which are more difficult to perform safely and consequently entail a higher degree of risk.

2. Some assignments involve instructing military student pilots in advanced flight techniques such as those which would be employed by helicopter pilots in combat situations. The instruction program includes training pilots to perform flight maneuvers which take advantage of terrain features or vegetation to prevent detection by a potential enemy. Assignments may also involve training and evaluating pilots in tactical flying at night, under various lighting conditions, including flying with the use of night vision goggles. A substantial degree of hazard is present due to the fact that flight instruction involves flying the helicopter at or below treelines, and in very close proximity to ridges and hills. Such assignments require a very high degree of vigilance on the part of the instructor to monitor actions of the student, maintain the position/location of the helicopter, and to be prepared to assume control should that become necessary.

Flying Assignments

1. Some flying assignments at this level involve operating light single- or twin-engine airplanes or helicopters at minimum controllable speeds or at low altitudes, or both, over unfavorable terrain for such purposes as: observing tracks and signs made by aliens entering the United States illegally, tracking game, determining how well equipment for spraying insecticides functions, spotting and observing and dropping retardants on forest fires, directing air tankers in dropping fire retardants, or making patrol of powerlines to identify and inspect maintenance problems. These assignments often involve making flights over uncharted courses and using meadows or roads for landing strips. These assignments are distinguished from the GS-11 level by the greater degree of skills and judgment required to fly at low altitudes over unfavorable terrain. Flying low in desert heat is difficult, for example, because air currents vary at that temperature making aircraft behave unpredictably. An additional factor of difficulty is that the pilots must direct their attention outside the aircraft for sustained periods of time. Moreover, at low altitudes there is little chance to maneuver to a favorable landing site in the event of trouble. Such assignments are characterized by a substantial degree of hazard due to the flight regimen of the aircraft, the environment, and the demands on the pilot.

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2. Assignments at this level also include flying heavy multiengine transport aircraft to transport personnel, supplies and equipment to a variety of points throughout the continental United States. Flights may involve a pattern of routes and destinations, and vary according to the demands of the assignment. Typically, the flights are made day and night in generally favorable weather and require considerable skill in instrument techniques. Flight planning responsibilities and associated knowledge requirements are similar to those described at the next lower grade. Such assignments differ from those at GS-11 in terms of the requirement for extended flights and the aircraft involved. Flying assignments of this type are characterized by a minimum degree of hazard.

Maintenance Test Assignments

Flight test assignments at the GS-12 level involve performance of functional check flights of light single- or twin-engine airplanes or helicopters after repair or replacement of damaged or worn components, extensive maintenance has been performed, or approved modifications have been made to the aircraft systems. Repair or replacement means that like components are used to replace faulty items or the repair involves restoration of the aircraft to its original configuration. Approved modifications are those which have been developed and flight tested prior to being incorporated into the aircraft.

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For these types of assignments, the pilot performs standard operational tests to determine whether the aircraft systems are functioning correctly, and to verify that predetermined flight and performance characteristics have been restored. The extent of testing that must be conducted depends on the nature of the repairs or modification work performed. These assignments require a thorough knowledge of the operational capabilities and limitations of

the aircraft. The degree of hazard involved is minimal when the tests involve such operations as testing newly installed navigational equipment. A higher degree of hazard is present in the work when major components, such as a replaced engine, are being tested.

PILOT, GS2181-13
FLIGHT INSTRUCTOR, GS2181-13
AIRSPACE SYSTEM INSPECTION PILOT, GS2181-13
FLIGHT TEST PILOT, GS2181-13

Assignments characteristics of the GS-13 level involve application of the knowledge and skills required:

-- To instruct or evaluate student pilots in advanced instrument flight technique; to provide combat training to rated pilots in the operation of a variety of advanced military aircraft; to instruct fixed or rotary wing pilots in methods of instruction and evaluate their proficiency to engage in flight instruction; to instruct and evaluate test pilots, to perform special projects involving a comparable responsibility and skill; or combinations of these assignments.

-- To fly heavy twin-engine or multiengine aircraft equipped with electronic devices used to inspect air navigational facilities, and to evaluate the safety and practicability of terminal and enroute flight procedures.

-- To fly heavy multiengine airplanes on extended flights, with responsibility for transporting passengers and/or cargo to and from a wide variety of domestic or foreign points.

-- To test aircraft with substantially modified systems.

Flight Instruction Assignments

1. Instrument flight instructor assignments at the GS-13 level involve training and evaluating student or rated pilots in the advanced techniques and procedures for flying fixed and rotary wing aircraft using instruments. Advanced instrument techniques include training in instrument flight planning, precision handling and maneuvering of the aircraft, instrument flight using aircraft navigational instruments and systems (e.g., radio directing and position finding systems) in conjunction with air navigational aids (e.g., omnidirectional radio ranges), area navigation, air traffic control operations and procedures and pilot interface with those activities, instrument approach and departure procedures, holding procedures, and use of instrument landing systems. Students are also taught emergency procedures used in, for example, missed approaches and radio failure. The instructors plan, schedule, and conduct cross-country training flights which require reliance on precision instrument flight techniques because they involve flying along the Federal airways. As at lower levels, the instructors

grade and evaluate progress of their students. These assignments entail a marked degree of hazard due to the demands for concentration
characteristic of instrument flight.

2. Other flight instructor assignments typical of this level entail providing refresher and mission related training to pilots in the reserves flight training programs. Aircraft in which instruction is provided range from high performance jet fighters to heavy multiengine transport airplanes. Assignments cover both ground instruction and in-flight training and evaluation. Instructors train pilots to fly the full range of aircraft maneuvers or capabilities necessary to accomplish the unit's flying mission. Combat mission related training for fighter pilots requires extensive aerobatic maneuvers, close formation flying, high-speed low-level flight, aerial refueling, two or more ship aggressor and defensive combat, and practice over gunnery ranges with heavy ordnance. Transport and tanker pilots are trained to deliver and airdrop cargo's and personnel or rendezvous with and refuel airplanes within the United States and overseas. Overseas flights can entail transporting very heavy loads into short or marginal airstrips or shepherding and refueling fighter formations in long distance delivery operations. The instructor monitors progress during
training, and advises when the pilot is considered ready for formal flight evaluation.

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Initially, assignments may involve a minimum degree of hazard. As the instruction involves more difficult maneuvers (e.g., low-level high-speed gunnery practice or high-gravity combat maneuvers), the hazard increases to a substantial degree.

3. Other flight instructor assignments at the GS-13 level involve training and evaluating rated pilots in methods of instruction. Assignments which involve training other instructors include, in
addition to in-flight evaluation, monitoring classroom instruction to evaluate other instructors' techniques and procedures; checking instructors' grade books to train them in correct grade book procedures; formulating lesson plans and instructional material used in classrooms; and revising methods of instruction and other training procedures in use. Also characteristic of this level is the performance of periodic in-flight examination of other instructors as well as evaluations of the instructor's subject-matter knowledge. Some positions may have an additional responsibility for evaluating an organization's performance in terms of the application of safe and accepted flight procedures, and recommending corrective action or additional training. Assignments to train and evaluate other instructors entail a marked degree of hazard. While those being trained are rated pilots, the flight evaluations include the most difficult and hazardous maneuvers and procedures.

At this level, instruction in flight test techniques is for flight testing characteristic of this level or lower levels. Flight test instruction involves a substantial degree of hazard.

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Flying Assignments

1. Some assignments at this level involve flying heavy multiengine airplanes (including those classed as "jumbos") over very long distances to a wide variety of locations in this country and overseas for the purpose of transporting cargo and/or personnel. Flights typically involve distances that are significantly greater than those for similar assignments at the next lower grade, except that overseas flights require that the pilot be familiar with international flight procedures and terminology, and the air traffic control procedures applicable in foreign countries. Since such flights typically involve extended over-water flying, they are characterized by a marked degree of hazard. These assignments are distinguished from similar work at the GS-12 level primarily by the weight of aircraft flown and by the variety of different areas and destinations to which flights are made.

2. Other assignments at this level involve the operation of high performance jet aircraft in law enforcement work under substantially hazardous conditions. Assignments include operation of aircraft equipped with sensor and radar equipment to intercept aircraft suspected of being involved in smuggling activities, performing surveillance or shadowing of suspect aircraft to obtain their identification, and tracking the aircraft to the point of landing. Flights are made both day and night with a substantial portion of the flights made over water. Such operations frequently entail prolonged periods of flying as suspects attempt to avoid apprehension, and require constant attention to the movements of the suspect aircraft. The work requires constant coordination with other aircraft involved in the operation, ground units, and controlling activities. Such assignments are characterized by a substantial degree of hazard due to such factors as high-speed intercept operations, flying in extremely close formation to suspect aircraft, prolonged periods of flying, and operating at night without lights and in all weather conditions.

Flight Test Assignments

Flight test assignments at this level involve aircraft with substantially modified systems and are characterized by a substantial degree of hazard. Such assignments require the application of a very high degree of skill in determining aircraft performance and flight characteristics under critical flight conditions of loading, speed, and maneuvers. Substantial modifications are those which are significant enough to influence the flight characteristics of the aircraft to a pronounced degree. These assignments are performed, for example, to certify aircraft as meeting prescribed safety standards after substantial modifications. They require an exceptionally wide background of experience and training to evaluate aircraft operational procedures and mechanical deficiencies and recommend new procedures or corrective action. Assignments involve compiling reports on the suitability, functioning, and general practicability of the aircraft and components or systems.

Air Space System Inspection Assignments

Assignments to conduct in-flight inspection of air navigational facilities involve evaluation of the quality of the signals emitted from navigational aids for the purpose of determining conformance to operational standards and verifying facility integrity. Flight evaluations are conducted both day and night, under visual or instrument conditions, using turbine powered airplanes with sophisticated computer equipment to evaluate the quality of the signal throughout all of the facility's parameters. The air navigational facilities inspected and certified include, but are not limited to: very high frequency omnidirectional ranges, tactical air navigation facilities, instrument landing systems, nondirectional beacons, precision approach radar systems, surveillance radar and air traffic control radar beacon systems, microwave landing systems, Loran C, global positioning systems, and communications systems.

Assignments that involve inspecting air navigation aids require a complete knowledge of instrument flight procedures and their impact on users operating different kinds of aircraft, many types of navigational aids and equipment, and the flight inspection ()) equipment and procedures used. These assignments require the skill to position the aircraft with extreme precision in order to sense, record, and evaluate the accuracy, adequacy, and reliability of air navigation aids; determine facility performance while in flight through the analysis of computer generated readouts; evaluate the safety and practicability of flight procedures used in air traffic movement; and apply sound judgment in making decisions to certify the navigational aid as accurate and reliable for continued use, to restrict usage to specified parameters, or to remove the aid from service.

Assignments that involve development and review of terminal and enroute flight procedures, and evaluation of proposed changes to the airspace system through in-flight evaluation and analysis of data, include: (1) development, maintenance, and revision of instrument flight pr ocedures, including evaluation of such factors as facility performance, the nature and extent of interference from physical obstructions, controlled air space, and communications with respect to applicable regulations and standards; (2) amendment of regulations and aeronautical publications to authorize operational use of instrument flight procedures; (3) testifying as an expert witness at formal hearings concerning regulations and instrument flight procedures; (4) determining the need for new air navigation aids to solve safety problems and improve operational capabilities; or (5) evaluating the effect of proposed obstructions, altered or deactivated airports, and
revisions to controlled air space as they affect flight operations.

Assignments that involve development of instrument approach procedures require a complete knowledge of controlling regulations, policies, and criteria; air carrier and general aviation operations, with particular emphasis on pilot limitations; air navigation facilities and lighting aids; and aircraft limitations and capabilities. These assignments require the ability to evaluate complex flight operations and apply existing regulations, policies, and criteria without jeopardizing safety; and the ability to deal successfully with members of industry and state and local governments.

In-flight inspection assignments are characterized by a substantial degree of hazard. Flights frequently involve flying at very low altitudes and speeds, and for prolonged periods in high traffic density terminal areas, where the flight inspection work must be integrated with normal terminal traffic operations. These flights are frequently against the normal flow of air traffic and require intense concentration and coordination. Other assignments of a hazardous nature include inspections after an accident, where a navigational aid is suspect and the objective is to replicate conditions which existed at the time of the accident.

Staff Assignments

GS-13 flight instructors who perform special staff projects write flight training procedures; review, revise, and develop training texts and evaluation material; and originate new material pertaining to flight training programs such as that needed to instruct in new equipment and procedures. These flight instructors maintain records and compile reports concerning the results of special projects. They evaluate major courses of instruction for ways of improvement and for adjustment of the course to meet revised training needs. Actual aircraft operation in these assignments is relatively limited and so is the degree of hazard involved. That lack is offset by the extremely high degree of knowledge the incumbent must have of the total flight training program and the characteristics of different categories of aircraft, flight simulation, and related equipment. Such assignments as these are more typical of staff positions in a training school environment, or the headquarters organization responsible for managing an aviation program.

FLIGHT TEST PILOT, GS2181-14
TEST PILOT FLIGHT INSTRUCTOR, GS2181-14

Assignments at the GS-14 level are characterized by a substantial degree of hazard and involve application of the knowledge and skills required to conduct approval tests of new or critically modified aircraft or to instruct pilots in flight test techniques and responsibilities. Flight test pilots at this level may be concerned with the aerospace flight factors of new and distinct aircraft models, which can include turbojet, turboprop, turboshaft, unducted fan, reciprocating, and turbosupercharged propulsion systems; pressurized and unpressurized cabins; and a wide variety of mechanical, electrical, hydraulic, pneumatic, and other systems. Critically modified aircraft may include, for example, "stretched" versions of conventional models with newly designed systems, when the modifications are significant enough to materially change the flight characteristics of the aircraft or require certification in the type aircraft. Test flights are conducted under the most critical conditions of loading, speed, and maneuvers.

Assignments involve evaluation of advanced or unconventional aircraft with sophisticated systems. Qualitative tests include evaluation of such things as controllability, stability, stall, and

spin characteristics; mach effects and buffet boundaries, critical engine determination and landing without engine power; systems operation, cockpit visibility and lighting, arrangement and location of controls and displays, natural icing tests, and ground handling characteristics. Quantitative tests include such things as takeoff and landing distance and climb performance, stall speed, air and ground minimum control speed determination, and helicopter hover performance and limiting height-velocity determination. Assignments often require flying the aircraft with minimum familiarization and no formal checkout. Flight tests are conducted at critical configurations to establish maximum weight, center of gravity extremes, maximum airspeeds and operating altitudes, runway requirements, and emergency operating procedures.

GS-14 test pilots prepare, or collaborate with others (e.g., engineers) in preparing, general and detailed flight test programs for aircraft submitted for certification and evaluation. Evaluations are conducted day and night, under visual and instrument flight rules, during icing and turbulence, in restricted visibility, in strong crosswinds, and under the most adverse anticipated operating conditions. These programs specify the nature and extent of the flight tests required, the order in which the tests are to be conducted to obtain the necessary information, and the nature of the instrumentation to be installed for the various tests involved.

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The aircraft tests performed also encompass areas of training, engineering, and human factors. On the basis of such tests, GS-14 test pilots assist in determining such factors as maximum takeoff and landing weights, aircraft configuration, minimum takeoff and landing field lengths, and other operating limitations.